GEORGIA INSTITUTE OF TECHNOLOGY
OFFICE OF CONTRACT ADMINISTRATION
SPONSORED PROJECT INITIATION

Date: 2/10/79

Project Title: Continuous Operation of the Georgia Tech Meteor Wind Radar, 1978-81

Project No: E-16-622 (Grant Code)

Project Director: R. G. Roper

Sponsor: National Science Foundation

Agreement Period: From 12/1/78 Until 5/31/81
(Grant Period — includes 6-months unfunded flexibility period)

Type Agreement: Grant No. ATM-7811741

Amount: $100,100 (NSF)
3,248 (GIT E-16-334)
$103,348 TOTAL

Reports Required: Annual Progress Report; Final Project Report

Sponsor Contact Person (s):

Technical Matters
H. Carlson
National Science Foundation
Washington, D. C. 20550

Contractual Matters
(thru OCA)
F. Graves
National Science Foundation
Washington, D. C. 20550

Defense Priority Rating: n/a

Assigned to: Aerospace Engineering (School/Laboratory)

COPIES TO:

Project Director
Division Chief (EES)
School/Laboratory Director
Dean/Director—EES
Accounting Office
Procurement Office
Security Coordinator (OCA)
Reports Coordinator (OCA)
Library, Technical Reports Section
EES Information Office
EES Reports & Procedures
Project File (OCA)
Project Code (GTRI)
Other

CA-3 (3/76)

B-440

GEORGIA INSTITUTE OF TECHNOLOGY
OFFICE OF CONTRACT ADMINISTRATION

SPONSORED PROJECT TERMINATION

Date: 6/5/81

Project Title: Continuous Operation of the Georgia Tech Meteor Wind Radar, 1978-81

Project No: E-16-622

Project Director: R.G. Roper

Sponsor: National Science Foundation; Grant No. ATM-7811741

Effective Termination Date: 5/31/81

Clearance of Accounting Charges: 5/31/81

Grant/Contract Closeout Actions Remaining:

_ Final Invoice and Closing Documents
X Final Fiscal ~~Report~~ Accounting (FCTR)
X Final Report of Inventions
_ Govt. Property Inventory & Related Certificate
_ Classified Material Certificate
_ Other _____

Assigned to: Aerospace Engineering (School/~~Laboratory~~)

COPIES TO:

Administrative Coordinator
Research Property Management
Accounting Office
Procurement Office/EES Supply Services
Research Security Services
✓ Reports Coordinator (OCA)
Suspense

Legal Services (OCA)
Library, Technical Reports
EES Research Public Relations (2)
Project File (OCA)
Other: _____

GEORGIA INSTITUTE OF TECHNOLOGY
SCHOOL OF GEOPHYSICAL SCIENCES

Atlanta, Georgia 30332
(404) 894-2857

October 17, 1980

Dr. Vincent Wickwar
Atmospheric Research (Aeronomy)
NSF
Room 644
1800 G Street, N.W.
Washington, D.C. 20550

Subject: Annual Technical Letter, NSF Grant No. ATM78-11471 "Continuous Operation of the Georgia Tech Meteor Wind Radar, 1978-80" (Georgia Tech Project E-16-622)

(Renewal of this grant has been requested through the School of Geophysical Sciences: Proposal ID No. ATM80-18485)

Dear Dr. Wickwar:

As detailed in my last annual technical letter, this has been a period of upheaval for the Georgia Tech Radio Meteor Wind Facility.

The relocation of the transmitter early this year did not proceed as smoothly as I had anticipated. Both equipment racks were dropped during the move, but (unfortunately, as it turned out) worked for a few days after initial switchon. The moving expenses were paid, and there was no recourse possible for the subsequent failures which, I certainly feel, were caused by mishandling during the move.

Through April, one fault after another developed: blown rectifiers in the power supply, the modulation transformer shorting, the crystal going bad, a short in the antenna, and intermittent interference to the WREK radio transmitter which is housed in the same building. All these faults were cured, but insufficient data was gathered to enable subsequent wind analysis.

In the meantime, additional loads had been placed on the three phase circuit which fed the building, and so booster transformers were installed in April. Since the RF drive to the final power stage had always been marginal, the exciter was rebuilt.

When operation recommenced in May, a fault was discovered in the receiving antennas so these were rebuilt. Two receivers were also rebuilt during the summer while a new roof was being installed at the receiving site.

Routine operation commenced again in July, with a three week break in August (a receiver fault developed while I was on vacation) and a one week break in September while attempts were made to fix an intermittent fault in the transmitter. The transmitter finally broke down this week (the final plate decoupling capacitor burned up), and it is hoped that this will be the last of the equipment faults for some time at least!

A battery pack for the fieldsite clock and a tape recorder restart circuit are being built; data is occasionally lost due to power failures at the receiving site (these intermittent outages are associated with construction projects at Technology Park).

All the data reduction and analysis programs are now operational on the Geophysical Sciences Eclipse computer. Winds are being reduced week by week, the same day the data tape is brought in from the fieldsite.

We are looking foward to producing a continuous set of radio meteor wind data during the next Pre MAP-1 interval, November, 1980 through February, 1981, and beyond. These results, together with the continuous data set from the Ramey, Puerto Rico system (being operated under a separate NSF grant) should tell us much about the dynamics of the tropical/lower mid-latitude circulation at meteor heights, and coupled with other groundbased and satellite radiance data, a better understanding of stratosphere/mesosphere dynamical interactions.

Finally, a joint paper (with one of my prior graduate students) "Prevailing Wind in the Meteor Zone (80-100 km) Over Atlanta and its Association with Mid-Winter Stratospheric Warming" by P.M. Dolas and R. G. Roper has just been accepted for publication in the Journal of Atmospheric Sciences.

Yours sincerely,

Dr. R. G. Roper, Professor
Principal Investigator

RGR/spz

E76-622

NATIONAL SCIENCE FOUNDATION
Washington, D.C. 20550

FINAL PROJECT REPORT

NSF FORM 98A

PLEASE READ INSTRUCTIONS ON REVERSE BEFORE COMPLETING

PART I - PROJECT IDENTIFICATION INFORMATION

1. Institution and Address	2. NSF Program	3. NSF Award Number
Georgia Institute of Technology School of Aerospace Engineering Atlanta, Ga. 30332	Atmospheric Res.(Aeronomy)	ATM78-11741
	4. Award Period From 12/1/78 To 5/31/81	5. Cumulative Award Amount $100,100

6. Project Title

Continuous Operation of the Georgia Tech Meteor Wind Radar, 1978-1980

PART II - SUMMARY OF COMPLETED PROJECT *(FOR PUBLIC USE)*

The objective of this two year grant was to continue the continuous collection of upper atmosphere wind data by the Georgia Tech Radio Meteor Wind Facility.

Four factors contributed to the fact that this objective was only partially achieved A six month break in funding before the initiation of this grant caused data to be lost in late 1978. Road construction through the fieldsite at Technology Park/Atlanta (27 km northeast of the campus) caused further delay in operation, with a new site having to be found, new antennae erected, and the equipment relocated. When operation recommenced in September, 1979, an interference problem caused by the transmitter on campus could only be resolved by relocation of the transmitter. The transmitter was relocated to the WREK FM transmitter building on campus and a new antennae erected. Mutual interference problems at the new location were soon resolved, and continuous operation resumed in July, 1980. The new sites have proved to be better than the old, and with the exception of short breaks for equipment maintenance, a far better operational schedule has been achieved then was possible in the past.

Two significant papers have been prepared and published in this interval. Salby and Roper dealt with the long period oscillations which have been observed for some time at mesopause altitudes, and tentative identification with Haurwitz and Rossby-gravity modes made. Dolas and Roper showed that northern hemisphere winter polar stratospheric warmings significantly affect the dynamics of the northern midlatitude mesopause, and it is proposed that this effect may be of global extent at mesopause altitudes.

PART III - TECHNICAL INFORMATION *(FOR PROGRAM MANAGEMENT USES)*

ITEM *(Check appropriate blocks)*	NONE	ATTACHED	PREVIOUSLY FURNISHED	TO BE FURNISHED SEPARATELY TO PROGRAM	
				Check (✓)	Approx. Date
a. Abstracts of Theses	X				
b. Publication Citations		X			
c. Data on Scientific Collaborators	X				
d. Information on Inventions	X				
e. Technical Description of Project and Results				X	7/31/81
f. Other *(specify)*					

2. Principal Investigator/Project Director Name *(Typed)*	3. Principal Investigator/Project Director Signature	4. Date
Dr. R. G. Roper		4/29/81

Publication Citations:

Salby, Murry L., and R. G. Roper, "Long Period Oscillations in the Meteor Region," J. Atmos. Sci., 37, 237-244, 1980.

Dolas, Prakash M., and R. G. Roper, "Prevailing Wind in the Meteor Zone (80-110 km) over Atlanta and its Association with Midwinter Stratospheric Warming," J. Atmos. Sci., 38, 182-188, 1981.